

LISTING OF THE CLAIMS

1-32. (Cancelled)

33. (Previously presented) A substrate processing apparatus comprising:

a processing vessel forming a processing space;

a rotatable supporting table for supporting a substrate to be processed in the processing space, the substrate having a surface to be processed;

a first radical generation unit, provided at a first sidewall portion of the processing vessel, for forming first radicals by a high frequency plasma and supplying the first radicals into the processing space;

a second radical generation unit, provided at the first sidewall portion of the processing vessel, for forming second radicals by a high frequency plasma and supplying the second radicals into the processing space;

a gas exhaust port, provided at a second sidewall portion of the processing vessel, to exhaust the processing space, the second sidewall portion being disposed opposite to the first sidewall portion with the supporting table placed therebetween,

wherein the first and the second radical generation unit and the gas exhaust port are provided at the processing vessel, such that the first and the second radicals are respectively introduced from the first sidewall portion toward the second sidewall portion along a first and a second flow path which are substantially parallel to the surface of the substrate mounted on the supporting table, and

a flow adjusting plate interfering with the first flow path to change a flow direction thereof, the first radicals flowing into the processing space along the first flow path whose flow direction has been changed.

34. (Previously presented) The substrate processing apparatus of claim 33, wherein the first radical generation unit is a nitrogen radical generation unit and the second radical generation unit is a oxygen radical generation unit.

35. (Previously presented) The substrate processing apparatus of claim 34, wherein the nitrogen radical generation unit includes a first gas passageway and a first high frequency plasma generation unit formed at a part of the first gas passageway to excite a nitrogen gas passing therethrough into a plasma; and the oxygen radical generation unit includes a second gas passageway and a second high frequency plasma generation unit formed at a part of the second gas passageway to excite an oxygen gas passing therethrough into a plasma,

wherein the first and the second gas passageway are in communication with the processing space.

36. (Cancelled).

37. (Cancelled)

38. (Previously presented) The substrate processing apparatus of claim 33, wherein the distance between a center of the second flow path and that of the substrate mounted on the supporting table is 40 mm or less.

39. (Previously presented) The substrate processing apparatus of claim 33, wherein a center of the first flow path intersects with that of the second flow path substantially at a center of the substrate mounted on the supporting table.

40. (Cancelled).

41. (Previously presented) A substrate processing apparatus comprising:
a processing vessel forming a processing space;
a rotatable supporting table for supporting a substrate to be processed in the processing space, the substrate having a surface to be processed;
a first radical generation unit, provided at a first sidewall portion of the processing vessel, for forming first radicals by a high frequency plasma and supplying the first radicals into the processing space;
a second radical generation unit, provided at the first sidewall portion of the processing vessel, for forming second radicals by a high frequency plasma and supplying the second radicals into the processing space;
a gas exhaust port, provided at a second sidewall portion of the processing vessel, to exhaust the processing space, the second sidewall portion being disposed opposite to the first sidewall portion with the supporting table placed therebetween,
wherein the first and the second radical generation unit and the gas exhaust port are provided at the processing vessel, such that the first and the second radicals are respectively introduced from the first sidewall portion toward the second sidewall portion along a first and a second flow path which are substantially parallel to the surface of the substrate mounted on the supporting table, and
a flow adjusting plate interfering with the first flow path to supply the first radicals towards a center of the substrate mounted on the supporting table.

42-44. (Cancelled)

45. (Previously presented) The substrate processing apparatus of claim 33, wherein the first radicals and the second radicals are introduced into the processing vessel substantially parallel to the surface of the substrate.

46. (Previously presented) The substrate processing apparatus of claim 33, wherein the first radical generation unit is an oxygen radical generation unit and the second radical generation unit is a nitrogen radical generation unit.

47. (Previously presented) The substrate processing apparatus of claim 46, wherein the oxygen radical generation unit includes a first gas passageway and a first high frequency plasma generation unit formed at a part of the first gas passageway to excite a oxygen gas passing therethrough into a plasma; and the nitrogen radical generation unit includes a second gas passageway and a second high frequency plasma generation unit formed at a part of the second gas passageway to excite an nitrogen gas passing therethrough into a plasma,

wherein the first and the second gas passageway are in communication with the processing space.

48. (Previously presented) The substrate processing apparatus of claim 41, wherein the first radical generation unit is a nitrogen radical generation unit and the second radical generation unit is an oxygen radical generation unit.

49. (Previously presented) The substrate processing apparatus of claim 48, wherein the nitrogen radical generation unit includes a first gas passageway and a first high frequency plasma generation unit formed at a part of the first gas passageway to excite a nitrogen gas passing therethrough into a plasma; and the oxygen radical generation unit includes a second gas passageway and a second high frequency plasma generation unit formed at a part of the second gas passageway to excite an oxygen gas passing therethrough into a plasma,

wherein the first and the second gas passageway are in communication with the processing space.

50. (Previously presented) The substrate processing apparatus of claim 41, wherein a center of the first flow path intersects with that of the second flow path substantially at the center of the substrate mounted on the supporting table.

51. (Previously presented) The substrate processing apparatus of claim 41, wherein the first radicals and the second radicals are introduced into the processing vessel substantially parallel to the surface of the substrate.

52. (Previously presented) The substrate processing apparatus of claim 41, wherein the first radical generation unit is an oxygen radical generation unit and the second radical generation unit is a nitrogen radical generation unit.

53. (Previously presented) The substrate processing apparatus of claim 52, wherein the oxygen radical generation unit includes a first gas passageway and a first high frequency plasma generation unit formed at a part of the first gas passageway to excite a oxygen gas passing therethrough into a plasma; and the nitrogen radical generation unit includes a second gas passageway and a second high frequency plasma generation unit formed at a part of the second gas passageway to excite an nitrogen gas passing therethrough into a plasma, wherein the first and the second gas passageway are in communication with the processing space.